**IN THE CLAIMS:**

1.      (Original) A disk drive comprising:

actuator means for positioning a head relative to a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a driving signal for the driving means and the voltage signal, and for generating a disturbance estimation signal;

position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;

position control means for generating a position control means corresponding to the position error signal; and

correction means for combining the position control signal with the disturbance estimation signal to obtain the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal obtained by integrating the deviation signal, by a first coefficient and a signal obtained

3

by multiplying a proportional signal proportional to the deviation signal by a second

coefficient, and for generating the disturbance estimation signal.

2.      (Original) The disk drive according to claim 1, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage

detection means;

first multiplication means for multiplying the driving signal by a coefficient

consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means

by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition

value, obtained by adding an output of the second multiplication means and an output of

the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with

the voltage signal, and outputs a difference between the output of the second integral

means and the voltage signal to the second multiplication means and the first integral

means.

3.      (Original) The disk drive according to claim 1, wherein a ratio $k_2/k_1$ of the first

coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2-\omega d^2)$,

where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

4.    (Original) The disk drive according to claim 1, wherein

a control band of the disturbance estimation means is set wider than a control band of the position control means.

5.    (Currently Amended) [[A]] The disk drive according to claim 1 comprising:

~~actuator means for positioning a head relative to a disk;~~

~~driving means for driving the actuator means;~~

~~voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;~~

~~disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a driving signal for the driving means and the voltage signal, and for generating a disturbance estimation signal;~~

~~position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;~~

~~position control means for generating a position control means corresponding to the position error signal; and~~

~~correction means for combining the position control signal with the disturbance estimation signal to generate the driving signal,~~ wherein

the disturbance estimation means further comprises:

~~comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal;~~

filter means for cutting off a high frequency component of a proportional signal proportional to the deviation signal, and for generating a filter output signal; [[and]] <u>wherein</u>

~~addition means for adding~~ <u>the addition means adds</u> a signal obtained by multiplying an integral signal, obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying the filter output signal by a second coefficient, and ~~for generating~~ <u>generates</u> the disturbance estimation signal.

6.    (Original) The disk drive according to claim 5, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

7.    (Original) The disk drive according to claim 5, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$ where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

8.    (Original) The disk drive according to claim 5, wherein a control band of the disturbance estimation means is set wider than a control band of the position control means.

9.    (Withdrawn) A disk drive comprising:

actuator means for positioning a head relative to a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

position detection means for generating a position error signal corresponding to a current position of the head from servo information recorded on the disk in advance and detected by the head;

position control means for generating a position control means corresponding to the position error signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from the position control signal and the voltage signal, and for generating a disturbance estimation signal;

correction means for combining the position control signal with the disturbance estimation signal to generate the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal, obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.

10. (Withdrawn) The disk drive according to claim 9, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means

by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition

value, obtained by adding an output of the second multiplication means and an output of

the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with

the voltage signal, and outputs a difference between the output of the second integral

means and the voltage signal to the second multiplication means and the first integral

means.


11. (Withdrawn) The disk drive according to any one of claims 1 to 9 , wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to

substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$ where $\omega o$ is an estimation frequency of the

disturbance estimation means and $\omega d$ is a disturbance frequency.


12. (Withdrawn) The disk drive according to claim 9, wherein

the first coefficient is set at 1.


13. (Withdrawn) The disk drive according to claim 9, wherein

a control band of the disturbance estimation means is set wider than a control

band of the position control means.

14.     (Withdrawn) A disk drive comprising:

actuator means for positioning a head relative to a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the

actuator means, and for outputting a voltage signal;

position detection means for generating a position error signal corresponding to a

current position of the head from servo information recorded on the disk in advance and

detected by the head;

position control means for generating a position control means corresponding to

the position error signal;

disturbance estimation means for estimating a magnitude of a disturbance

applied to the head from the position control signal and the voltage signal, and for

generating a disturbance estimation signal;

correction means for combining the position control signal with the disturbance

estimation signal to generate the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by

the disturbance estimation means with the voltage signal, and for outputting a deviation

signal;

filter means for cutting off a high frequency component of a proportional signal

proportional to the deviation signal, and for generating a filter output signal; and

addition means for adding a signal obtained by multiplying an integral signal,

which is obtained by integrating the deviation signal, by a first coefficient and a signal

obtained by multiplying the filter output signal by a second coefficient, and for generating the disturbance estimation signal.

15.     (Withdrawn) The disk drive according to claim 14, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

16.     (Withdrawn) The disk drive according to claim 14, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o^2$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

17. (Withdrawn) The disk drive according to claim 14, wherein

the first coefficient is set at 1.

18. (Withdrawn) The disk drive according to claim 14, wherein

a control band of the disturbance estimation means is set wider than a control band of the position control means.

19. (Original) A disk drive control method comprising the steps of:

generating a position error signal corresponding to a current position of a head from servo information recorded on a disk in advance and detected by the head;

generating a position control signal corresponding to the position error signal;

generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means for positioning the head, based on a driving signal for the actuator means and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying

a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and positioning the head relative to the disk.

20.    (Original) The disk drive control method according to claim 19, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$ where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

21.    (Original) The disk drive control method according to claim 19, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.

22.    (Currently Amended) [[A]] The disk drive control method according to claim 19 further comprising the [[steps]] step of:

~~generating a position error signal corresponding to a current position of a head from servo information recorded on a disk in advance and detected by the head;~~

~~generating a position control signal corresponding to the position error signal;~~

13

~~generating a voltage estimation signal that is an estimate of a voltage signal,~~
~~which is generated when driving actuator means for positioning the head, based on a~~
~~driving signal for the actuator means and the voltage signal;~~

~~comparing the voltage estimation signal with the voltage signal, and generating a~~
~~deviation signal which indicates a difference between the voltage estimation signal and~~
~~the voltage signal;~~

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and <u>a signal obtained by multiplying</u> a filter output signal obtained by cutting off a high frequency component of a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating [[a]] <u>the</u> disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and positioning the head relative to the disk.

23.    (Original) The disk drive control method according to claim 22, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

24.    (Original) The disk drive control method according to claim 22, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.

25.    (Withdrawn) A disk drive control method comprising the steps of:

generating a position error signal corresponding to a current position of a head from servo information recorded on a disk in advance and detected by the head;

generating a position control signal corresponding to the position error signal;

generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means, based on the position control signal and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and generating the driving signal; and driving the actuator means by the driving signal, and positioning the head relative to the disk.

26.    (Withdrawn) The disk drive control method according to claim 25, wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to

substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the

disturbance estimation means and $\omega d$ is a disturbance frequency.

27.    (Withdrawn) The disk drive control method according to claim 25, wherein

the first coefficient is set at 1.

28.    (Withdrawn) The disk drive control method according to claim 25, wherein

a control band of the disturbance estimation is set wider than a control band of

the position control.

29.    (Withdrawn) A disk drive control method comprising the steps of:

generating a position error signal corresponding to a current position of a head

from servo information recorded on a disk in advance and detected by the head;

generating a position control signal corresponding to the position error signal;

generating a voltage estimation signal that is an estimate of a voltage signal,

which is generated when driving actuator means, based on the position control signal

and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a

deviation signal which indicates a difference between the voltage estimation signal and

the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by

integrating the deviation signal , by a first coefficient and a signal obtained by

multiplying a filter output signal obtained by cutting off a high frequency component of a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the position control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and positioning the head relative to the disk.

30. (Withdrawn) The disk drive control method according to claim 29, wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$ where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

31. (Withdrawn) The disk drive control method according to claim 29, wherein

the first coefficient is set at 1.

32. (Withdrawn) The disk drive control method according to claim 29, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.

33. (Withdrawn) A disk drive comprising:

actuator means for loading and unloading a head to and from a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a driving signal for the driving means and the voltage signal, and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity instruction signal and the voltage signal ; and

correction means for combining the velocity control signal and the disturbance estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.


34.     (Withdrawn) The disk drive according to claim 33, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal output from the voltage detection means;

18

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

35. (Withdrawn) The disk drive according to claim 33, wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega d$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

36. (Withdrawn) The disk drive according to claim 33, wherein

the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.

37.     (Withdrawn) The disk drive according to claim 33, wherein

a control band of the disturbance estimation means is set wider than a control

band of the velocity control means.


38.     (Withdrawn) A disk drive comprising:

actuator means for loading and unloading a head to and from a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the

actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance

applied to the head from a driving signal for the driving means and the voltage signal,

and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity

instruction signal and the voltage signal ; and

correction means for combining the velocity control signal and the disturbance

estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by

the disturbance estimation means with the voltage signal, and for outputting a deviation

signal;

filter means for cutting off a high frequency component of a proportional signal

proportional to the deviation signal, and for generating a filter output signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying the filter output signal by a second coefficient, and for generating the disturbance estimation signal.

39.    (Withdrawn) The disk drive according to claim 38, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the driving signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

40. (Withdrawn) The disk drive according to claim 38, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

41. (Withdrawn) The disk drive according to claim 38, wherein

the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.

42. (Withdrawn) The disk drive according to claim 38, wherein

a control band of the disturbance estimation means is set wider than a control band of the velocity control means.

43. (Withdrawn) A disk drive comprising:

actuator means for loading and unloading a head to and from a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a velocity control signal and the voltage signal, and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity instruction signal and the voltage signal; and

correction means for combining the velocity control signal and the disturbance estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and for generating the disturbance estimation signal.

44.     (Withdrawn) The disk drive according to claim 43, wherein the disturbance estimation means comprises:

comparison means which inputs the voltage signal detected by the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

45. (Withdrawn) The disk drive according to claim 43, wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

46. (Withdrawn) The disk drive according to claim 43, wherein

the first coefficient is set at 1.

47. (Withdrawn) The disk drive according to claim 43, wherein

the velocity control means generates the velocity control means from the velocity instruction signal and a velocity estimation signal generated by the disturbance estimation means.

48.    (Withdrawn) The disk drive according to claim 43, wherein a control band of the disturbance estimation means is set wider than a control band of the velocity control means.

49.    (Withdrawn) A disk drive comprising:

actuator means for loading and unloading a head to and from a disk;

driving means for driving the actuator means;

voltage detection means for detecting a voltage generated when driving the actuator means, and for outputting a voltage signal;

disturbance estimation means for estimating a magnitude of a disturbance applied to the head from a velocity control signal and the voltage signal, and for generating a disturbance estimation signal;

velocity control means for generating a velocity control signal from a velocity instruction signal and the voltage signal; and

correction means for combining the velocity control signal and the disturbance estimation signal, and for thereby generating the driving signal, wherein

the disturbance estimation means comprises:

comparison means for comparing the disturbance estimation signal generated by the disturbance estimation means with the voltage signal, and for outputting a deviation signal;

filter means for cutting off a high frequency component of a proportional signal proportional to the deviation signal, and for generating a filter output signal; and

addition means for adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying the filter output signal by a second coefficient, and for generating the disturbance estimation signal.

50.    (Withdrawn) The disk drive according to claim 49, wherein

the disturbance estimation means comprises:

comparison means which inputs the voltage signal output from the voltage detection means;

first multiplication means for multiplying the position control signal by a coefficient consisting of a first transfer function;

second multiplication means for multiplying an output of the comparison means by a coefficient consisting of a second transfer function;

first integral means for integrating the output of the comparison means; and

second integral means for integrating a value obtained by subtracting an addition value, which is obtained by adding an output of the second multiplication means and an output of the first integral means, from an output of the first multiplication means, and wherein

the comparison means compares an output of the second integral means with the voltage signal, and outputs a difference between the output of the second integral means and the voltage signal to the second multiplication means and the first integral means.

51.　(Withdrawn) The disk drive according to claim 49, wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to

substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the

disturbance estimation means and $\omega d$ is a disturbance frequency.


52.　(Withdrawn) The disk drive according to claim 49, wherein

the first coefficient is set at 1.


53.　(Withdrawn) The disk drive according to claim 49, wherein

the velocity control means generates the velocity control means from the velocity

instruction signal and a velocity estimation signal generated by the disturbance

estimation means.


54.　(Withdrawn) The disk drive according to claim 49, wherein

a control band of the disturbance estimation means is set wider than a control

band of the velocity control means.


55.　(Withdrawn) A disk drive control method comprising the steps of:

generating a velocity control signal corresponding to a velocity instruction;

generating a voltage estimation signal that is an estimate of a voltage signal,

which is generated when driving actuator means for loading and unloading a head,

based on a driving signal for the actuator means and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.


56. (Withdrawn) The disk drive control method according to claim 55, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/( \omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.


57. (Withdrawn) The disk drive control method according to claim 55, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.


58. (Withdrawn) A disk drive control method comprising the steps of:

generating a velocity control signal corresponding to a velocity instruction;

generating a voltage estimation signal that is an estimate of a voltage signal,

which is generated when driving actuator means for loading and unloading a head,

based on a driving signal for the actuator means and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a

deviation signal which indicates a difference between the voltage estimation signal and

the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by

integrating the deviation signal, by a first coefficient and a filter output signal obtained by

cutting of a high frequency component of a proportional signal proportional to the

deviation signal by a second coefficient, and thereby generating a disturbance

estimation signal;

combining the velocity control signal and the disturbance estimation signal, and

generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the

head to and from the disk.

59.    (Withdrawn) The disk drive control method according to claim 58, wherein

a ratio $k_2/k_l$ of the first coefficient $k_l$ and the second coefficient $k_2$ is set to

substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the

disturbance estimation means and $\omega d$ is a disturbance frequency.

60.    (Withdrawn) The disk drive control method according to claim 58, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.

61.     (Withdrawn) A disk drive control method comprising the steps of:

generating a velocity control signal corresponding to a velocity instruction;

generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means, based on the velocity control signal and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a signal obtained by multiplying a proportional signal proportional to the deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.

62.     (Withdrawn) The disk drive control method according to claim 61, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

63.     (Withdrawn) The disk drive control method according to claim 61, wherein the first coefficient is set at 1.

64.     (Withdrawn) The disk drive control method according to claim 61, wherein a control band of the disturbance estimation is set wider than a control band of the position control.

65.     (Withdrawn) A disk drive control method comprising the steps of:

generating a velocity control signal corresponding to a velocity instruction;

generating a voltage estimation signal that is an estimate of a voltage signal, which is generated when driving actuator means for loading and unloading a head, based on the velocity control signal and the voltage signal;

comparing the voltage estimation signal with the voltage signal, and generating a deviation signal which indicates a difference between the voltage estimation signal and the voltage signal;

adding a signal obtained by multiplying an integral signal, which is obtained by integrating the deviation signal, by a first coefficient and a filter output signal obtained by cutting off a high frequency component of a proportional signal proportional to the

deviation signal by a second coefficient, and thereby generating a disturbance estimation signal;

combining the velocity control signal and the disturbance estimation signal, and generating the driving signal; and

driving the actuator means by the driving signal, and loading and unloading the head to and from the disk.

66.    (Withdrawn) The disk drive control method according to claim 65, wherein

a ratio $k_2/k_1$ of the first coefficient $k_1$ and the second coefficient $k_2$ is set to substantially satisfy $\omega o^2/(\omega o^2 - \omega d^2)$, where $\omega o$ is an estimation frequency of the disturbance estimation means and $\omega d$ is a disturbance frequency.

67.    (Withdrwn) The disk drive control method according to claim 65, wherein

the first coefficient is set at 1.

68.    (Withdrawn) The disk drive control method according to claim 65, wherein

a control band of the disturbance estimation is set wider than a control band of the position control.